



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
-----------------	-------------	----------------------	---------------------	------------------

10/717,356

11/19/2003

Ralph Hobmeyr

8540G-000210

7713

27572 7590 08/18/2009
HARNESSE, DICKEY & PIERCE, P.L.C.
P.O. BOX 828
BLOOMFIELD HILLS, MI 48303

EXAMINER

WILLS, MONIQUE M

ART UNIT

PAPER NUMBER

1795

MAIL DATE

DELIVERY MODE

08/18/2009

PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No. 10/717,356	Applicant(s) HOBMEYR, RALPH	
	Examiner Monique M. Wills	Art Unit 1795	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 30 April 2009.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-8 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-8 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 19 November 2003 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Response to Amendment

This Office Action is responsive to the Amendment filed April 30, 2009.

The rejection of claims 1-8 under 35 U.S.C. 103(a) as being unpatentable over Vasileiadis et al. U.S. Pub. 6,919,062 in view of Kato et al. U.S. Pub. 2004/0157099 and further in view of Edlund et al. U.S. Pub. 2003/0159354 is reapplied on new grounds necessitated by amendment.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 1-8 are rejected under 35 U.S.C. 103(a) as being unpatentable over Vasileiadis et al. U.S. Pub. 6,919,062 in view of Kato et al. U.S. Pub. 2004/0157099 and further in view of Edlund et al. U.S. Pub. 2003/0159354.

With respect to **claim 1**, Vasileiadis et al. teach a fuel cell system comprising a conduit through which cooling fluid flows. See the Abstract. The cooling fluid (cool gas)

Art Unit: 1795

is recycled through a permreactor-separator, which comprises a hydrogen permeable tube (2), wherein hydrogen within the coolant fluid permeates through the later to reduce hydrogen content in the cooling fluid. See col. 3, line 65 to col. 4, line 5.

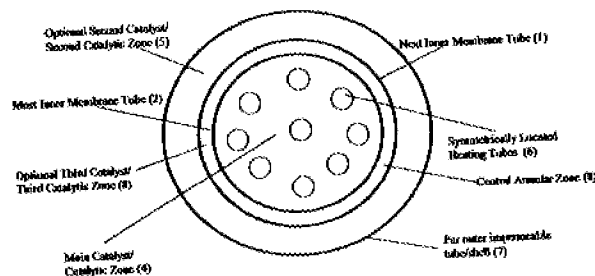


Fig. 1

The support layer (1) is a permeable membrane therefore providing a breathable (claim 3) mesh (claim 4) hydrogen permeates. With respect to **claim 5**, a second layer of hydrogen-permeable material (col. 20, lines 65-68 discloses multiple permeable tubes employed in the permreactor). With respect to **claim 6**, the central annular zone serves as support between the layers of hydrogen permeable material. See Figure 1. With respect to **claim 7**, the second catalytic zone (5) serves as a fluid-permeable protective layer disposed about the conduit, protecting the conduit from debris. See Figure 1. With respect to **claim 8**, the hydrogen permeable tub (1) has a catalyst coating to induce a reaction between hydrogen and oxygen to produce water. See Figure 1 and col. 3, lines 30-68.

Vasileiadis does not expressly disclose the fuel cell stack in fluid with the cooling fluid (claim 1). The reference is also silent to coolant passages passing between the membrane of the fuel cell. And a hydrogen permeable tube (claims 2-4).

Kato teaches that it is well known in the art to employ coolant passages between the membranes of fuel cells. See Figure 1.

Edlund teaches that it is well known in the art to employ hydrogen-permeable tubs in fuel cell stacks. See paragraph 43.

However, it would have been obvious to one of ordinary skill in the art at the time the instant invention was made to employ the fuel cell stack in fluid with the cooling fluid in order to control the stack temperature thereby improving fuel cell operation efficiency. Further, the permreactor-separator conduit of Vasileiadis is in fluid communication with the passages by providing fuel to the cell.

With respect to employing coolant passages between the membrane of the fuel cell, it would have been obvious to employ the cooling arrangement of Kato, in the fuel cell of Vasileiadis, in order to control stack temperature and reactivity between the fuel cells.

With respect to the hydrogen permeable tube, it would have been obvious to one of ordinary skill in the art at the time the instant invention was made to employ the tube of Edlund in the fuel cell of Vasileidis, in order to separate products in vicinity of the membrane tube.

Response to Arguments

Applicant's arguments with respect to claims 1-8 have been considered but are not persuasive. Applicant asserts that Vasileidis does not render obvious claim 1, because the reference does not disclose coolant passages passing between membranes of the fuel cell or a hydrogen permeable tube in fluid communication with coolant passages. This argument is not persuasive, as the location of the claimed coolant passages are the same as fuel passages. In other words, fluid passages are located between the proton exchange membrane and the electrodes. Thus, Vasileidis teach of a feed gas flowing through a permreactor-separator satisfies the instant claims, because the fuel from the permreactor will be charged to the fuel cell between the membrane and electrodes, in order for the fuel cell to function. Further, the permreactor-separator conduit is in fluid communication with the passages by providing fuel to the cell.

With respect to Kato (U.S. Pub. 2004/0157099), Applicant asserts that Kato does not teach or suggest a hydrogen-permeable conduit in fluid communication with coolant passages and comprising a first layer of hydrogen-permeable material, as claimed. This assertion is correct however, the reference was solely relied upon to show the conventionality of coolant passages. The hydrogen-permeable material is taught by Edlund.

With respect to Edlund, Applicant asserts that the reference does not cure the deficiencies of Vasileidis because the hydrogen-permeable tub is in a steam reformer. This argument is not persuasive, as the skilled artisan would look to constituents of the

Art Unit: 1795

fuel cell system, including reformers for devices to improve the structure of the fuel cell system. Further, Applicant asserts that Edlund does not teach passing hydrogen through the membrane tube, instead Edlund teaches passing hydrogen through the tube from the outside of the membrane tube. This argument is not persuasive, as the direction of hydrogen permeability does not preclude the skilled artisan from appreciating the hydrogen permeability characteristics irrespective of hydrogen gas flow. Therefore, the rejections are reapplied on new grounds to show the obviousness of fluid communication between the conduit and passages.

Conclusion

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of

Art Unit: 1795

the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the Examiner should be directed to Monique Wills whose telephone number is (571) 272-1309. The Examiner can normally be reached on Monday-Friday from 8:30am to 5:00 pm.

If attempts to reach Examiner by telephone are unsuccessful, the Examiner's supervisor, Patrick Ryan, may be reached at 571-272-1292. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR.

Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

/Monique M Wills/

Examiner, Art Unit 1795

/PATRICK RYAN/

Supervisory Patent Examiner, Art Unit 1795